

03/11/66
16 APR 2004

CLAIMS

What is claimed is:

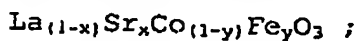
- 5 1. A process for purifying hydrogen from a stream of reformat gases comprising:
- a. preparing a flow cell in which 2 gas flows are separated by a solid state ceramic membrane,
- b. heating said cell to greater than 500C,
- 10 c. passing said reformat gas and a small amount of steam on one side of said membrane and steam on the second side of said membrane, and
- d. separating purified hydrogen from said second side of said membrane.
- 15 2. The process of claim 1 wherein said reformat gases are selected from the group consisting of:
- (a) mixtures of carbon monoxide and hydrogen;
- (b) mixtures of carbon monoxide and hydrogen containing small
- 20 quantities of other hydrocarbons or hydrocarbon reformat or inert gases such as Ar, He or nitrogen;
- (c) by-products from the partial oxidation or steam reformation of methane;
- (d) partial oxidation or steam methane reformation products of
- 25 other hydrocarbons;
- (e) products of carbon dioxide reformation of hydrocarbons;
- (f) products of autothermal reformation of methane and other hydrocarbons; and
- (g) mixtures thereof.
- 30 3. The process of claim 1 wherein said membrane is selected from the group consisting of single phase and two-phase membranes.

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4. The process of claim 3 wherein said membrane is selected from the group consisting of:

strontium doped lanthanum iron cobalt oxide of the composition



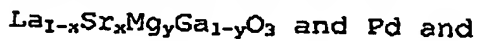
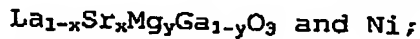
yttria stabilized zirconia doped with an oxide selected from the group consisting of MnO_2 , TiO_2 , FeO , Cr_2O_3 and other transition metal oxides;

10 undoped CeO_2 ;

CeO_2 doped with an oxide selected from the group consisting of MnO_2 , TiO_2 , FeO , Cr_2O_3 and other transition metal oxides;

yttria stabilized zirconia and a metal selected from the group consisting of Pd, Pt, Ni, Ag and Au;

15 RE_2O_3 doped CeO_2 , where RE is Y, Yb, Sc, or Gd, and a metal selected from the group consisting of Pd, Pt, Ni, Ag and Au;

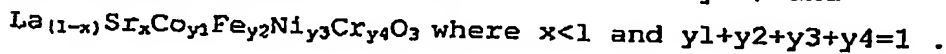
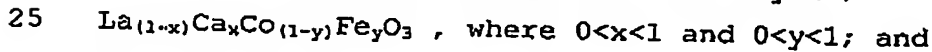
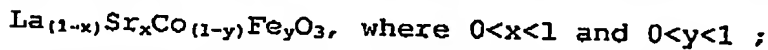


mixtures thereof, where $x < 1$, $y < 1$, and $y_1 + y_2 + y_3 + y_4 = 1$.

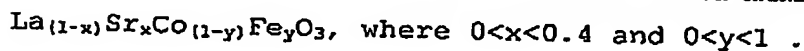
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5. The process of claim 3 wherein said membrane is selected from the group consisting of:

strontium doped lanthanum iron cobalt oxide of the composition



6. The process of claim 3 wherein said membrane is



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7. The process of claim 3 wherein said membrane is



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